

REMARKS

Claims 5-15 were previously pending in this application.

Claims 5-15 stand rejected under 35 U.S.C. 112, first paragraph.

Claims 5-8, 10-12 and 14 stand rejected under 35 U.S.C. 102(e).

Claims 9, 13 and 15 stand rejected under 35 U.S.C. 103(a).

No new matter has been added.

Claims 5-15 remain in the case for reconsideration.

Applicant requests reconsideration and allowance of the claims in light of the following remarks.

Claim Rejections – 35 USC § 112

Claims 5-15 stand rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection is respectfully traversed.

The Examiner alleges that “[t]here does not appear to be a written description of the claim limitation “wherein the first sub-plug fills a lower portion of the contact hole to a level substantially below a top surface of the insulating layer” in the application as filed.

MPEP 2163.06, however, states that:

“[I]nformation contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter. Also, it is held in *In re Wolfensperger*, 302 F.2d 950, 133 USPQ 537 (C.C.P.A. 1962) that drawings may provide an adequate written description of the invention in the event the written disclosure portion of the application inadvertently omitted such as written description.

Therefore, because the above limitation is clearly shown in FIG. 2 of the instant application, no new matter has been introduced to the instant application. One of ordinary skill in the art would know what is meant by the above limitation in view of FIG. 2. Thus, the rejection under 35 USC § 112 is improper.

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Claim Rejections – 35 USC § 102

Claims 5-8, 10-12 and 14 stand rejected under 35 U.S.C. 102(e) as being clearly anticipated by U.S. Pat. No. 6,380,084 issued to Lim (“Lim”) (cited previously).

The rejection is respectfully traversed.

Claim 5 recites:

“forming a *contact plug* in the contact hole by forming a first sub-plug that fills a lower portion of the contact hole and forming a second sub-plug that fills an upper portion of the contact hole on the first sub-plug,

wherein the first sub-plug fills a lower portion of the contact hole *to a level substantially below a top surface of the insulating layer.*”

The Examiner alleges that Lim teaches:

“forming an insulating layer (52) having a contact hole therethrough on a semiconductor substrate (40)...

forming a plug in the contact hole....”

On the contrary, Lim merely teaches forming copper vias, not a contact plug as recited in amended claim 5. The copper vias are formed by filling the openings or via trenches formed in the intermetal dielectric layers (the dielectric layers between metal levels) with copper according to the Lim reference. And via caps 68 merely overlie the vias for encapsulation. See FIGS. 15-16 of the Lim reference. Also see S. Wolf, Silicon Processing for the VLSI Era Volume 2 – Process Integration 189 (1990).

The specification of the present application at page 1, lines 12-22, however, explains the contact plug as follows:

“A contact plug formed within an insulating layer between a semiconductor substrate and a bit line or a storage electrode has been used for connecting an active region on the semiconductor substrate and the bit line, for connecting an active region on a semiconductor substrate and a storage electrode of a capacitor, and for connecting an active region of a peripheral circuit or a gate electrode and a bit line.”

For these reasons, vias of the Lim reference are different from a contact plug as recited in claim 5. Lim, therefore, does not teach or disclose forming a contact plug in a contact hole.

Further, the Lim reference does not teach or disclose “the first sub-plug fills a lower portion of the contact hole to a level substantially below a top surface of the insulating layer, as further recited in amended claim 5.

Accordingly, Lim does not teach or disclose all of the elements of claim 5 and, thus, does not anticipate claim 5, especially in view of the amendment. Also, claims 6-8, 10-12 and 14, which depend from allowable claim 5 and recite features that are neither disclosed nor taught by the Lim reference, are allowable.

Claim Rejections – 35 USC § 103

Claims 9 and 13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Lim as applied to claim 5 above, and further in view of U.S. Patent No. 5,801,096 issued to Lee (“Lee”).

Claim 15 stands rejected under 35 U.S.C. 103 (a) as being unpatentable over Lim as applied to claim 8 above, and further in view of Grill et al (“Grill”). (U.S. Pub. No. 2002/0127844).

The rejection is respectfully traversed.

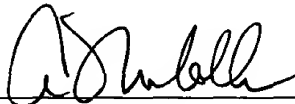
For the reasons discussed above, none of the cited references including Lim, either alone or in combination, teach or suggest the limitations recited in claims 9, 13 and 15, which depend from allowable claim 5. Further, Grill is not a proper prior art reference because the Grill patent application was filed on May 13, 2002 while the instant application was filed on September 17, 2001.

Thus, the Examiner has not presented a *prima facie* case of obviousness. Accordingly, claims 9, 13 and 15, which depend from allowable claim 5 and recite features that are neither or disclosed by the prior art, are also allowable.

For the foregoing reasons, reconsideration and allowance of claims 5-15 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

MARGER JOHNSON & McCOLLOM, P.C.

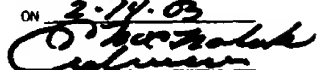


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ON 2-14-03


VERSION WITH MARKINGS TO SHOW CHANGES MADE

No Amendments made at this time.